DOCUMENT RESUME

ED 085 111 PS 007 023

AUTHOR Harris, Mary B.
TITLE Modeling and Flexible Problem-Solving.
PUB DATE Aug 73
NOTE 7p.; Paper presented at the Annual Convention of the American Psychological Association (81st, Montreal, Canada, August 27 through 31, 1973)

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Behavior Development; *Creativity; *Imitation; *Learning Processes; *Literature Reviews; *Problem Solving
IDENTIFIERS *Modeling

ABSTRACT

This literature review concerns the relationships between imitation-modeling as a learning process and creative behaviors. If it can be demonstrated that creative (unusual, flexible) behaviors are increased upon seeing other creative behaviors modeled, this finding would contradict the simple matching to template interpretation for modeling influences, as well as provide clues as to effective methods for teaching creativity. After analyzing three studies which are related to this issue, it is concluded that the effects of modeling are not confined to providing precise demonstrations of the kinds of behaviors deemed desirable. A model presented as incidental to the subject's task, who demonstrates behavior different from that used as a dependent variable, can still affect the flexibility or rigidity of an observer's problem solving behavior. (DP)

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Modeling and Flexible Problem-Solving

Mary B. Harris

The University of New Mexico

Presented in a symposium entitled "New Developments in Conceptual Social Learning" at the American Psychological Association convention, August, 1973.

The issue of the origin of novel, original, or creative behaviors is one which has concerned learning theorists for a long while. Trial and error, shaping of successive approximations and, more recently, modeling (Bandura, 1969, 1971a, 1971b) have all been proposed as explanations for the occurrence of new behaviors in an individual's repertoire. It is now generally agreed that exposure to a model can lead an observer to demonstrate behavior which is not only new for him, but also novel in a broader sense, as when a general rule is abstracted from the model's behavior and the observer then generates novel examplars of that rule. Probably the best examples of this are in the realm of linguistic behaviors, where after hearing various grammatical constructions (e.g. Bandura and Harris, 1966), types of questions (e.g. Rosenthal, Zimmerman and Durning, 1970) or complex sentences modeled (e.g. Harris and Hassemer, 1972), children constructed similar but novel sentences of the same type. However, little research has been done to see whether exposure to a creative model can increase flexible, creative behavior, as well as the extent to which exposure to a rigid model would produce rigid or stereotyped behavior. An increase in unusual behaviors after seeing others modeled, would contradict a simple matching-to-template interpretation fo modeling influences, as well as having practical implications for teaching and fostering creativity.

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A few studies related to this issue have been done. Rosenbaum and Arenson (1967) found that Ss tended to solve Luchin's water jar problems using the same approach as a model. Levy (1968) found that Ss asked to imitate the responses of a model who produced unusual work associations gave more unusual associations than those in a control group, although fewer than Ss in a role playing plus reinforcement condition. Zimmerman and Dialessi (in press) found that a highly fluent model increased the fluency and flexibility of a child's responses on similar and generalization tasks but that exposure to a flexible model produced decreases in performance on both these tasks. The present paper reports three studies which were conducted to assess the extent to which a model's flexible or rigid behavior can lead to flexible, divergent and creative, or rigid and convergent behavior on the part of an observer. The latter two also attempted to assess the amount of generalization such modeling influences would produce to other tasks requiring other responses.

In the first study Harris and Fisher (1973) randomly assigned college students to view a model who solved anagrams in a flexible manner, one of two rigid model conditions, or one of two control conditions. Ss were run in groups, and the model was always presented as a student from the same class called to the board to solve a few anagrams, just to be sure that everyone in the class knew how to solve anagrams. Any pressures to imitate were, therefore, very mild. As predicted, Ss exposed to the model who solved anagrams in varied ways produced more varied solutions to the anagrams used as a dependent measure. An unexpected finding was

that those seeing a model solve anagrams in a rigid manner, using only one approach, showed greater flexibility in their solutions than those seeing no model at all. This effect was not soley a result of learning to solve anagrams better through observation, since the groups did not differ in total number of correct solutions. It is possible that this improvement as a result of seeing a model was a response facilitation effect of modeling, wherein the mere observation of someone solving anagrams may have stimulated a set to solve them flexibly, which operated more efficiently when observing a flexible model than when observing a rigid model.

Two experiments with Robert Evans (Harris and Evans, 1973a, 1973b) looked at the effect of a symbolic (written) model on a variety of tests of creativity or original thinking. In the first study, several classrooms of college students were told that we were studying thinking in college students, randomly assigned to conditions by booklet, and shown a sample answer sheet on an unusual uses task which was either blank (no model) filled out with a large number of convergent answers, filled out with a small number of convergent answers, or filled out with a large number of divergent answers. No implicit or explicit instructions to imitate were given. Ss then completed a different unusual uses task, a pattern naming task and an identical unusual uses task, all of which were scored for divergent and convergent answers. Those in the prolific and non-prolific convergent model conditions did not differ from each other, contradicting the results of Zimmerman and Dialessi, who found

modeled fluency to be an important determinant of creative responding, but they produced more convergent and fewer divergent responses than those in the divergent model group, with those seeing no model scoring in between. These effects were strongest on the identical task and weakest on the dissimilar pattern recognition task.

The second study compared the effects of exposure to a divergent or convergent thinking model with instructions to respond creatively and no model on several other creativity tasks. Using a similar paradigm, Ss were randomly assigned to the four conditions, with the instructions or modeling manipulation again being delivered via booklets. Tasks used as dependent measures were a "what if" speculation task, a story completion task, an unusual uses task different from the one modeled, and an identical unusual uses task. Fewer statistically significant results were obtained on the generalization tasks than in the previous study but the pattern of results was completely consistent. On all measures, the divergent model group produced the greatest number of divergent or creative responses, followed by the instructions, no model and convergent model groups; on all measures those seeing the convergent model produced the greatest number of convergent responses, followed by those in the no model, divergent model and instructions groups.

All three studies have shown that viewing a model who exhibits flexible, divergent or creative behavior can increase the amount of this behavior over that shown by a control group; it also appears as if this modeling effect may be more potent than simple instructions to give

novel, original creative responses. The effects of viewing a rigid or convergent thinking model are somewhat less consistent, since on the anagrams task such a model appeared to increase flexibility over that of a no-model group, whereas on the creativity tasks, Ss who had seen a model give convergent unusual uses were more likely to give convergent responses and less likely to give divergent ones than those in a no-model group.

Certainly, there are limits on the extent to which such model influences can be generalized to dissimilar tasks. The results of the present studies indicate, however, that the effects of modeling are not confined to providing precise demonstrations of the kinds of behaviors deemed desirable. A model presented as incidental to the S's task, who demonstrates behavior quite different from that used as a dependent measure, can still affect the flexibility or rigidity of an observer's problem-solving behavior.

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